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(54) **A REACH LIFT-TRUCK**

(57) A reach lift-truck (1) comprising a sliding support device (30) for slidably supporting the reach carriage (10) against one or both flanges (4, 5) of a guide track (3.1, 3.2) wherein the sliding support device (30) comprises;
- a sliding block arrangement (40) arranged in sliding contact with one or both flanges (4, 5) of a guide track (3.1,3.2), and;
- a wedge arrangement (60) arranged to force the sliding block arrangement (40) against one or both of the flanges (4, 5) of the guide track (3.1, 3.2), wherein;
- the wedge arrangement (60) is movable relative the sliding block arrangement (40) such that the contact pressure between the sliding block arrangement (40) and one or both of the flanges (4, 5) of the guide track (3.1, 3.2) may be increased or decreased by movement of the wedge arrangement (60).

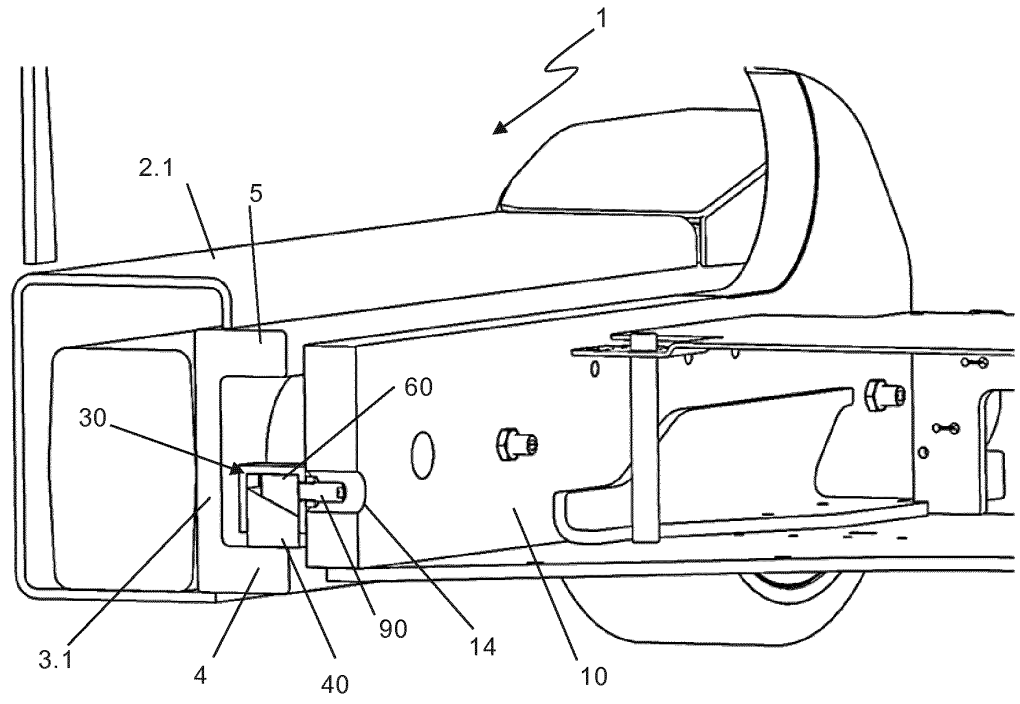

Fig.3

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Description

Technical field

[0001] The present disclosure relates to a reach lift-truck.

Background art

[0002] In reach lift-trucks the mast that carries the lift forks of the truck is arranged on a reach carriage that is movable back and forth in guide tracks that extends along the support legs of the lift-truck. This type of lift-truck is advantageous since the reach function makes it possible to leave or lift a load from the floor level without causing the support legs to hit the load or the pallet rack.

[0003] Figure 1 shows schematically a reach lift truck 1 with a movable reach carriage 10 according to the present disclosure. The first support leg 2.1 has been made partially transparent to indicate two guide rolls 21, 22. The reach lift truck 1 is described further under the section "Detailed description of embodiments" of the present disclosure.

[0004] Figure 2 shows a cross-sectional view of a support leg of a reach lift truck according to the prior-art. The prior-art reach lift truck is not shown in detail, but has several features in common with the reach lift truck of figure 1. Thus, figure 2 shows a portion of a reach carriage 10 and a portion of a guide track 3.1 in the form of a U-beam. The support leg 2.1 and the web of the U-beam 3.1 has been omitted to not obscure other features. The reach carriage 10 is supported by guide rolls 21, 22 in the U-beam 3.1. The reach carriage 10 is balanced on the front guide roll 21 and a small support roll 15 is provided behind the rear guide roll 22 to prevent that the reach carriage 10 tilts about the front guide roll 21. The support roll 15 should be adjusted with a small play to the flange 4 of U-beam 3.1 to ensure smooth movement of the support roll 15 during movement of the reach carriage 10. However, the distance between the flanges 4, 5 of the U-beam 3.1 varies over the length of the U-beam and this leads to difficulties in adjusting the play between the support roll 15 and the flange 4 of the beam. Too large play may lead to tilting and too small play may lead to that the support roll 15 is pressed with great force in to the flange 4 and thereby deforms the U-beam.

[0005] JP201058930 shows reach lift-truck with a movable reach carriage that comprises a support block that is adjustable towards the flange of the beam by an adjustment screw. However, the head of the adjustment head is covered by the upper flange of the U-beam and thus very difficult to access for maintenance personnel.

[0006] Consequently, it is an object of the present disclosure to provide an improved reach lift-truck which has a sliding support device that solves or mitigates at least one problem of the prior art. In detail it is an object of the present disclosure to provide a reach lift-truck that has a sliding support device in which the sliding block is easy adjust relative the flange of a guide track. It is further an object of the present disclosure to provide a reach lift-truck which has a sliding support device that causes little wear to the guide track of the reach truck.

Summary of the disclosure

[0007] According to the present disclosure, at least one of these objects is achieved by a reach lift-truck comprising two opposing support legs, respectively having a guide track with vertically spaced apart flanges; and a reach carriage which movable arranged in the guide tracks of each support leg; and at least one sliding support device for slidably supporting the reach carriage against one or both flanges of a guide track characterized in that the sliding support device comprises;

- a sliding block arrangement arranged in sliding contact with one or both flanges of the guide track, and;
- a wedge arrangement arranged to force the sliding block arrangement against one or both of the flanges of the guide track, wherein;
- the wedge arrangement is movable relative the sliding block arrangement such that the contact pressure between the sliding block arrangement and one or both of the flanges of the guide track may be increased or decreased by movement of the wedge arrangement.

[0008] A main advantage is provided by applying a wedge arrangement to force the sliding block arrangement against the flange/s of the guide track. Namely, the mating inclined surfaces of the wedge arrangement and the sliding block arrangement causes the sliding surface of sliding block arrangement to be forced with a uniform contact pressure against the flange of the guide track. That is, the contact pressure is uniform over the sliding surface of the sliding block arrangement. This leads to less wear and damage to the flange of the guide track. It is also results in an even wear of the sliding block arrangement. This is advantageous because it reduces the need of replacing the sliding block arrangement. As the sliding block wears, it suffices to continue to increase the contact pressure between the sliding block and the flange.

[0009] Preferably, the sliding support device comprises an actuator for moving the wedge arrangement relative the sliding block arrangement, wherein the actuator is elongate and extends from a rear surface of the wedge arrangement and parallel to the sliding surface of sliding block arrangement. The advantage of using a wedge arrangement is that it may be moved by a force that is applied orthogonal to the orientation of the sliding block arrangement. Thus, since the actuator extends parallel to the sliding surface of sliding block arrangement it may be placed in positions that are easy to access by maintenance personnel. For example, in a through opening in the reach carriage or close to the end of the guide track.

[0010] Preferably, the actuator is rotationally arranged in the sliding support device such that rotation of the actuator in a first rotational direction moves the wedge arrangement is a first operational direction (A) in which the contact pressure is increased and such that and rotation of the actuator in a second rotational direction (B) moves the wedge arrangement in a second operational direction (B) in which the contact pressure is decreased.

[0011] In detail, the sliding block arrangement comprises a sliding surface arranged in sliding contact with one or both flanges of the guide track and a contact surface arranged opposite to the sliding surface, wherein the contact surface is inclined relative the sliding surface.

[0012] Accordingly, the wedge arrangement comprises an inclined contact surface that is in sliding contact with the contact surface of the sliding block arrangement.

[0013] The sliding support device may comprise an abutment for slidably supporting a surface portion of the wedge arrangement.

Brief description of the drawings

[0014]

Figure 1: A schematic drawing of a reach-lift truck according to the present disclosure.

Figure 2: A schematic drawing of a guide arrangement for the reach carriage of a reach lift-truck according to the prior-art.

Figure 3: A schematic drawing of a portion of a reach lift-truck and a sliding support device according to a first alternative of the present disclosure.

Figure 4: A schematic drawing of the sliding support device of the first alternative of the present disclosure in detail.

Figure 5: A schematic drawing of a portion of a reach lift-truck and a sliding support device according to a second alternative of the present disclosure.

Figure 6: A schematic drawing of the sliding support device of the second alternative of the present disclosure in detail.

Figure 7, 8: Schematic drawings showing the function of the of the sliding support device according to the second alternative of the present disclosure

Definitions

[0015] In the following specification directions, such as "vertical", "horizontally", etc. are intended with reference to the ground on which the reach lift-truck is standing.

Detailed description of embodiments

[0016] The reach lift-truck according to the present disclosure will now be described more fully hereinafter. The reach lift-truck according to the present disclosure may however be embodied in many different forms and should not be construed as limited to the embodiment set forth herein. Rather, these embodiment is provided by way of example so that this disclosure will be thorough and complete, and will fully convey the scope of the present disclosure to those persons skilled in the art.

[0017] Figure 1 shows schematically a reach lift-truck 1 of the present disclosure. The reach lift-truck 1 comprises a mainframe 7 which in its forward portion extends into two forward support legs 21, 22 carrying support wheels 6.1, 6.2 A drive wheel (not shown) is arranged in the rear of the mainframe 7. The mainframe 7 supports a chassis 8 in which an electrical drive motor for propelling the drive wheel and a hydraulic system for providing hydraulic power to movable parts on the lift-truck is accommodated (not shown in figure 1). The chassis 8 further comprises a driver's compartment 9, comprising a seat and controls for driving and controlling the lift-truck (partially shown in figure 1). The lift-truck 1 further comprises a lifting mast 11 and a lifting fork 13 which is movable along the lifting mast 11. Since figure 1 is cropped the upper section of lifting mast 11 and the drivers compartment 9 are not visible. The reach lift truck 1 further comprises a reach carriage 10 which supports the lifting mast 11. Each support leg 2.1 and 2.2 comprises a guide track 3.1 and 3.2 which extends along the respective support leg 2.1, 2.2 in direction from the chassis 8 to the support wheels 6.1, 6.2. Each guide track 3.1, 3.2 comprises a first and a second flange 4, 5 which are spaced apart in vertical direction. The guide tracks 3.1 and 3.2 are arranged on the inner side of the support legs 2.1, 2.2 and thus facing each other. The guide tracks 3.1, 3.2 may be realized by a respective U-beam.

[0018] The reach carriage 10 is movable arranged in the respective guide tracks 3.1, 3.2 so that the reach carriage 10 may be moved back and forth along the support legs 2.1, 2.2. For this purpose, the reach carriage 10 may comprise a guide roll arrangement which comprises a first and, possibly, a second guide roll 21, 22. The guide rolls 21, 22 are attached to guide shafts (not shown) on the mast carrier 10 and supports the reach carriage onto the flanges 4, 5 of the guide tracks 3.1, 3.2 during movement of reach carriage 10.

[0019] Turning to figure 3. According to the present disclosure, the reach lift-truck 1 comprises at least one sliding support device 30 for slidably supporting the reach carriage 10 onto one or both of the flanges 4, 5 of a guide track 3.1, 3.2.

[0020] Figure 3 shows a portion of the support leg 2.1 of a reach lift-truck 1 comprising a sliding support device 30 according to a first alternative of the present disclosure. The sliding support device 30 comprises a sliding block arrangement in the form a sliding block 40 which is arranged in sliding contact with one flange 4 of the guide track 3.1 on the support leg 2.1. The sliding support device 30 further comprises a wedge arrangement in the form a wedge element 60 that is arranged to force the sliding block 40 against the flange 4 of the guide track 3.1. An advantage with this alternative is that it comprises few parts and may be realized at low cost. It is also easy

to mount.

[0021] Figure 4 shows a detailed view of the sliding support device 30. Thus, the sliding block 40, comprises a sliding surface 41 is planar and supports the sliding block 40 in erect orientation onto the flange 4. Thus, the sliding surface 41 of the sliding element 40 may extend in a horizontal plane x - y. The sliding block 40 further comprises a contact surface 42 which is arranged opposite to the sliding surface 41 and that is inclined relative the sliding surface 41. Thus, the contact surface 42 forms a sharp angle with the sliding surface 41. The sliding surface 41 and the contact surface 42 are aligned in vertical direction. Preferably, the sliding block 40 is made of a material that is softer than the material of the guide track 3.1 (typically steel). This results in that the support block 40 is subjected to wear and the flanges 4, 5 of the guide track 3.1 not subjected to wear from the sliding block 40. Preferably, the sliding block 40 is made of polymer material such as polyamide PA-6.

[0022] The wedge element 60 comprises a first contact surface 61 that is in sliding contact with contact surface 42 of the sliding block 40. The first contact surface 61 of the wedge element 60 has an inclination that corresponds to the inclination of the contact surface 42 of the sliding element 40. Thus, the first contact surface 61 of the wedge element 60 is inclined relative the sliding surface 41 of the sliding block 40 by the same angle as the contact surface 42 of the sliding block 42. The inclination angle may for example be 5° - 45°. A large inclination angle results in that a small displacement of the wedge element causes a large change of the contact surface. A small inclination angle makes it possible to adjust the contact pressure with high accuracy. Preferably the inclination angle is 15° - 30°. The inclination angle of the wedge element 60 and the sliding element 40 may be determined relative the x - y plane in figure 4.

[0023] The second contact surface 62 of the wedge element 60 is opposite to the first surface 61 and may be planar, i.e. parallel to the sliding surface 41 of the sliding element 40 and to the flange 4. The sliding support device 30 may further comprise a holder 80 for holding the sliding element 40 and the wedge element 60. The holder 80 comprises a top wall 81 and a circumferential wall 82 and is configured to be attached to the reach carriage 11 as shown in figure 3. The top wall 81 forms an abutment for the second contact surface 62 of the wedge element 60.

[0024] The sliding support device 30 further comprises an actuator 90 for moving the wedge element 60. The actuator 90 may be an elongated rod of which a first end is rotationally supported onto an end surface 63 of the wedge element 60. The actuator 90 may be rotationally attached to the circumferential wall 82 of the holder 80. For example, the actuator 90 comprises a threaded portion 91 and the holder 80 a threaded opening 84 (such as a nut) for receiving the threaded portion 91 in threaded engagement. As is shown in figure 3 and 4, the actuator 90 extends parallel to the sliding surface 41 of the sliding element 40. The reach carriage 10 comprises an opening 14 which allows access to the actuator 90.

[0025] Turning to figure 3. A further advantage with the sliding support device 30 according to the first alternative is that the actuator 90 easily may be accessed by maintenance personnel. As shown in figure 3 the actuator 90 extends parallel with the flanges 4, 5 of the guide track 3.1 and transverse with the longitudinal extension of the guide track 3.1. This makes it possible to place a portion of the actuator 90 in a through hole 14 in the reach carriage 10. Maintenance personnel may easily access the actuator 90 from the opposite side of the reach carriage through the hole 14.

[0026] In operation, the sliding block 40 is arranged such that the sliding surface 41 is in sliding engagement with the flange 4 of the guide track 3.1. The wedge element 60 is arranged such that the first, inclined, contact surface 61 is in sliding contact with the contact surface 42 of the sliding element 40. The second contact surface 62 of the wedge element 60 is in sliding contact with the inner surface of the top wall 81, or arranged with a small play thereto.

[0027] Rotation of the actuator 90 in a first direction A thereby pushes the wedge element 60 forward, in a first operational direction, between the top wall 82 of the holder and the contact surface 41 of the sliding block 40. This causes the wedge element 60 to force the sliding element 40 towards the flange 4 of the guide track 3.1. The further the wedge element 60 is moved relative the sliding element 40, the higher the contact pressure between the sliding surface 41 of the sliding element 40 and the flange 4 will become.

[0028] Rotation of the actuator 90 in a second direction B thereby results in that the wedge element 60 is returned, in a second operational direction, and the contact pressure is decreased.

[0029] Figure 5 shows a second alternative of the sliding support device 30 according to the present disclosure. The sliding support device 30 comprises a sliding block arrangement, that comprises a first and a second sliding block 50.1, 50.2. The first sliding block 50.1 is in sliding contact with a first flange 4 of the guide track 3.1 and the second sliding block 50.2 is in sliding contact with a second flange 5 of the guide track 3.1. The sliding support device 30 further comprises a wedge arrangement in the form of a first and a second wedge element 70.1, 70.2 that are arranged to force the first and the second sliding blocks 50.1, 50.2 against the first and the second flange 4, 5 of the guide track 3.1. In the alternative shown in figure 5, the sliding support device 30 is configure to be attached to a roll shaft 21 of the reach carriage 10. The sliding support device may thereby replace one of the guide rolls of reach carriage (see figure 2). This is advantageous because both guide roll 21, 22 and the support roll 15 of a prior-art reach lift-truck (see figure 2) may be replaced. This is both economically advantageous and reduces wear to the guide tracks.

[0030] Figure 6 shows the sliding support device 30 in detail. Thus, the first sliding block 50.1 comprises a slid-

ing surface portion 51.1 that is arranged in sliding contact with the first flange 4 of the guide track 3.1 (see figure 5). The first sliding block 50.1 further comprises first and second contact surface portion 52.1, 52.1' that are arranged opposite to, and inclined relative, the sliding surface portion 51.1. As shown in figure 6, the features of the sliding support device 30 are identical on both sides of the vertical symmetry axis y. Thus, the first contact surface portion 52.1 and the second contact surface portion 52.1' are inclined with identical positive inclination towards the center axis y.

[0031] The second sliding block 50.2 comprises a sliding surface portion 51.2 that is arranged in sliding contact with the second flange 5 of the guide track 3.1 (see figure 5). The second sliding block 50.2 further comprises first and second contact surface portions 52.2, 52.2' that are arranged opposite to, and inclined relative, the sliding surface portion 51.2. Also the features of the second sliding block 50.2 are identical on are identical on both sides of the vertical symmetry axis z. Thus, the first contact surface portion 52.2 and the second contact surface portion 52.2' are inclined with identical negative inclination towards the center axis z.

[0032] The sliding block arrangement 30 may further comprise a support plate 100 with a hollow support cylinder 110. The support plate 100 may be attached to the reach carriage 10 such that the roll shaft 21 extend through the hollow support cylinder 110 (see figure 5). However, in embodiments the support plate 100 and the support cylinder may be omitted.

[0033] The first and the second sliding block 50.1, 50.2 comprises a cylindrical recess 53.1, 53.2 that extends between the first and second contact surface portions 52.1-1' and 52.1-2'of each sliding block. Each of the cylindrical recesses 53.1, 532 are configured to receive a portion of the circumferential surface of the support cylinder 110, or if the support cylinder is omitted, to receive a portion of the cylindrical roll shaft 21. Preferably, the sliding blocks 50.1, 50.2 are made of a material that is softer than the guide track 3.1. Preferably, the sliding blocks 50.1, 50.2 are made of polymer material, such as polyamide PA-6.

[0034] The wedge arrangement 70 comprises a first and a second wedge element 70.1, 70.2 that are arranged opposite to each other along a horizontal symmetry axis x.

[0035] The first wedge element 70.1 has a first and second inclined contact surface portion 71.1 and 72.1 arranged opposite each other. The second wedge element 70.2 has also a first and a second inclined contact surface portion 71.2, 72.2. The first and the second wedge element 70.1, 70.2 further comprises a respective rear surface 73.1, 73.2 that faces away from the symmetry axis z and a respective front surface 74.1, 74.2 that faces the symmetry axis z. The respective front surfaces 74.1, 74.2 may be concave, and cylindrical to receive a portion of the of the circumferential surface of the cylindrical roll shaft 13.The wedge arrangement 70 is arranged such that the first and the second contact surface portion 71.1 and 72.1 of the first wedge element 70.1 are in sliding contact with the first contact surface portions 52.1 of the first sliding block 50.1 and with the first contact surface portion 52.2 of the second sliding block 50.2. Likewise first and the second contact surface portion 71.2 and 72.2 of the second wedge element 70.2 are in sliding contact with the second contact surface portion 52.1' of the first sliding block 50.1 and with the second contact surface portion 52.2' of the second sliding block 50.2. The front and the rear surface 73.1-2 and 74.1-2 of the first and second wedge elements 70.1, 70.2 are oriented orthogonal to the sliding surfaces 51.1 and 51.2 of the first and second sliding block 50.1, 50.2.

[0036] Considerations regarding the correspondence of the inclination of the contact surface portions 51.1, 51. 2 of the first and the second sliding block 50.1, 50.2 and the contact surface portion 71.1-2, 72.1-2 of the first and the second wedge element 70.1, 70. 2 are the identical to the ones discussed under the first alternative of the present disclosure. The sliding support device 30 further comprises an actuator 90 that is elongated and extends through the first and the second wedge element 70.1, 70.2 and through the center of the roll shaft 21 (which comprises a through opening). Thus, the actuator 90 extends parallel with the sliding surfaces 51.1 and 51.2 of the first and second sliding block 50.1, 50.2 and through the rear and front surfaces 73.1-2 and 74.1-2 of the first and the second wedge element 70.1, 70.2. Thus, the actuator 90 extends along a horizontal symmetry axis x of the sliding support device.

[0037] Turning to figure 5. A further advantage with the sliding support device 30 according to the second alternative is that the actuator 90 easily may be accessed by maintenance personnel. As shown in figure 5, the actuator 90 extends horizontally, parallel with the flanges 4, 5 of the guide track 3.1 and along the extension of the guide track. This makes it possible to reach the end of the actuator merely by inserting a key-tool such as a wrench or an Allen key (not shown,) between the flanges at the rear end of the guide track 3.1.

[0038] The actuator 90 is rotationally arranged in the siding support 30 such that rotation of the actuator 90 results in that the first and the second wedge element are moved relative the sliding blocks 50.1, 50.2.

[0039] Turning to figure 7. The end portion 91 of the actuator 90 comprises threads (not shown) that are in engagement with the mating threads (not shown) in the first wedge element 70.1. The front end of the actuator 90 comprises a head 92 that abuts against the rear surface 73.2 of the second wedge element 70.2 Rotation of the actuator 90 in a first rotational direction A therefore results in that the first and second wedge element 70.1, 70.2 are moved axially in a first operational direction towards each other. In practice, the first wedge element is pulled towards the center of the sliding support device 30 by engagement between the threads on wedge element 70-1 and the end portion 91 of the actuator 90. The

second wedge element 70.2 is pushed towards the center of the sliding support device 30 by the head 92 of the actuator 90. The first and the second wedge elements 70.1., 70.2 thereby forces sliding blocks 50.1, 50.2 against the first and the second flange 4, 5 of the guide track 3.1 (see figure 5) and increases thus the contact pressure between the sliding surfaces 51.1, 51.2 of the sliding blocks 50.1, 50.2 and the flanges 4, 5. Turning to figure 8. Rotation of the actuator 90 in a second rotational direction B results in that the first and second wedge element 70.1, 70.2 are moved axially in a second operational direction away from each other. The contact pressure between the sliding surfaces 51.1, 51.2 of the sliding blocks 50.1, 50.2 and the flanges 5, 6 is thereby released.

[0040] In detail, the first and the second contact surface 52.2, 52.2' of the second sliding block from an abutment for the first and second wedge element 70.1, 70.2 when forcing the first sliding block 50.1 against the first flange 4 of the guide track 3.1. Simultaneous, the first and the second contact surface 52.1, 52.1' of the first sliding block 50.2 form an opposite abutment for the first and second wedge element 70.1, 70.2 when forcing the second sliding block 50.2 against the second flange 5 of the guide track 3.1.

Claims

1. A reach lift-truck (1) comprising two opposing support legs (2.1, 2.2), respectively having a guide track (3.1, 3.2) with vertically spaced apart flanges (4, 5); and a reach carriage (10) which is movable arranged in the guide tracks (3.1, 3.2) of each support leg (2.1, 2.2); and at least one sliding support device (30) for slidably supporting the reach carriage (10) against one or both flanges (4, 5) of the guide track (3.1, 3.2) **characterized in that** the sliding support device (30) comprises;

   - a sliding block arrangement (40, 50.1, 50.2) arranged in sliding contact with one or both flanges (4, 5) of the guide track (3.1,3.2), and;
   - a wedge arrangement (60, 70.1, 70.2) arranged to force the sliding block arrangement (40, 50.1, 50.2) against one or both of the flanges (4, 5) of the guide track (3.1, 3.2), wherein;
   - the wedge arrangement (60, 70.1, 70.2) is movable relative the sliding block arrangement (40, 50.1, 50.2) such that the contact pressure between the sliding block arrangement (40, 50.1, 50.2) and one or both of the flanges (4, 5) of the guide track (3.1, 3.2) may be increased or decreased by movement of the wedge arrangement (60, 70.1, 70.2).

2. The reach lift-truck (1) according to claim 1, wherein the sliding block arrangement (40, 50.1, 50.2) comprises a sliding surface (41, 51.1, 51.2) arranged in sliding contact with one or both flanges (4, 5) of the guide track (3.1, 3.2) and a contact surface (42, 52.1-1', 52.2-2') arranged opposite to the sliding surface (41, 51.1, 51.2), wherein the contact surface (42, 52.1-1', 52.2-2') is inclined relative the sliding surface (41, 51.1, 51.2).

3. The reach lift-truck (1) according to claim 2, wherein the wedge arrangement (60, 70.1, 70.2) comprises an inclined contact surface (61, 71.1-2, 72.1-2) that is in sliding contact with the contact surface (42, 52.1-1', 52.2-2') of the sliding block arrangement (40, 50.1, 50.2).

4. The reach lift-truck (1) according to claim 2 or 3, wherein the sliding support device (30) comprises an actuator (90) for moving the wedge arrangement (60, 70.1, 70.2) relative the sliding block arrangement (40, 50.1, 50.2), wherein the actuator (90) is elongate and extends from a rear surface (63, 63.1) of the wedge arrangement (60, 70.1, 70.2) and parallel to the sliding surface of sliding block arrangement (100).

5. The reach lift-truck (4) according to claim 4, wherein the actuator (90) is rotationally arranged in the sliding support device (30) such that rotation of the actuator (90) in a first rotational direction moves the wedge arrangement (60, 70.1, 70.2) is a first operational direction (A) in which the contact pressure is increased and such that and rotation of the actuator (90) in a second rotational direction (B) moves the wedge arrangement (60, 70.1, 70.2) in a second operational direction (B) in which the contact pressure is decreased.

6. The reach lift-truck (1) according to anyone of claims 3 to 5, wherein the sliding support device (30) comprises an abutment (81; 52.1-1', 52.2-2') for slidably supporting a contact surface portion (62, 72.1-2, 71.1-2) of the wedge arrangement (60, 70.1, 70.2).

7. The reach lift-truck (1) according to any one of claims 1 - 5, wherein;

   - the sliding block arrangement (40, 50.1, 50.2) is a sliding block (40) comprising a sliding surface (41) arranged in sliding contact with a first flange (4) of a guide track (3.1, 3.2) and a contact surface (42) arranged opposite to, and inclined relative, the sliding surface (41), and;
   - the wedge arrangement (60, 70.1, 70.2) is a wedge element (60) having a first inclined contact surface portion (61) and a second opposed contact surface portion (62), and;
   - the sliding support device (30) comprises an abutment (81), wherein the wedge element (60) is arranged such that the first contact surface

portion (61) is in sliding contact with the contact surface (42) of the sliding block (41) and the second contact surface portion (62) is in sliding contact with the abutment (81).

8. The reach lift-truck (1) according to claim 7, wherein the sliding support device (30) comprises a holder (80) for holding the sliding block (40) and the wedge element (60) having top wall (81) and a circumferential wall (82), and an open bottom (83) through which the sliding surface (41) of the sliding block (40) extends, wherein the wedge element (60) is arranged such that the second contact surface portion (62) is sliding contact with top wall (81) of the holder (80).

9. The reach lift-truck (1) according to claim 7 or 8 in combination with claim 4, wherein the mast carrier (10) comprises an through opening (14) for allowing access to the actuator (90).

10. The reach lift-truck (1) according to anyone of claims 1 - 5, wherein the sliding block arrangement (60, 50.1, 50.1) comprises a first and a second sliding block (50.1, 50.2), wherein,

- the first sliding block (50.1) comprises a first sliding surface portion (51.1) arranged in sliding contact with a first flange (4) and first and second contact surface portions (52.1, 52.1') arranged opposite to, and inclined relative, the first sliding surface portion (50.1), and;
- the second sliding block (50.2) comprises a second sliding surface portion (51.2) in sliding contact with a second flange (5) and first and second contact surfaces (52.2, 52.2') arranged opposite to, and inclined relative, the second sliding surface portion (51.2), and;
- the wedge arrangement (60, 70.1, 70.2) comprises a first and a second wedge element (70.1, 70.2), respectively having opposing first and second inclined contact surface portions (71.1, 72.1; 71.2, 72.2), wherein;
- the first and the second contact surface portion (71.1, 72.1) of the first wedge element (70.1) are in sliding contact with the first contact surfaces (52.1, 52.2) of the first and the second sliding block (50.1, 50.2 and the first and the second contact surface portions (71.2,72.2) of the second wedge element (70.2) are in sliding contact with the second contact surface portions (52.1', 52.2') of the first and the second sliding block (50.1, 50.2), wherein;
- the first and the second wedge element (70.1, 70.2) are arranged on opposite sides of a vertical symmetry axis (z) extending through the first and second sliding surface portions (51.1, 51.2) of the first and second sliding block (50.1, 50.2) and arranged to be moved axially towards each other, or away from each other.

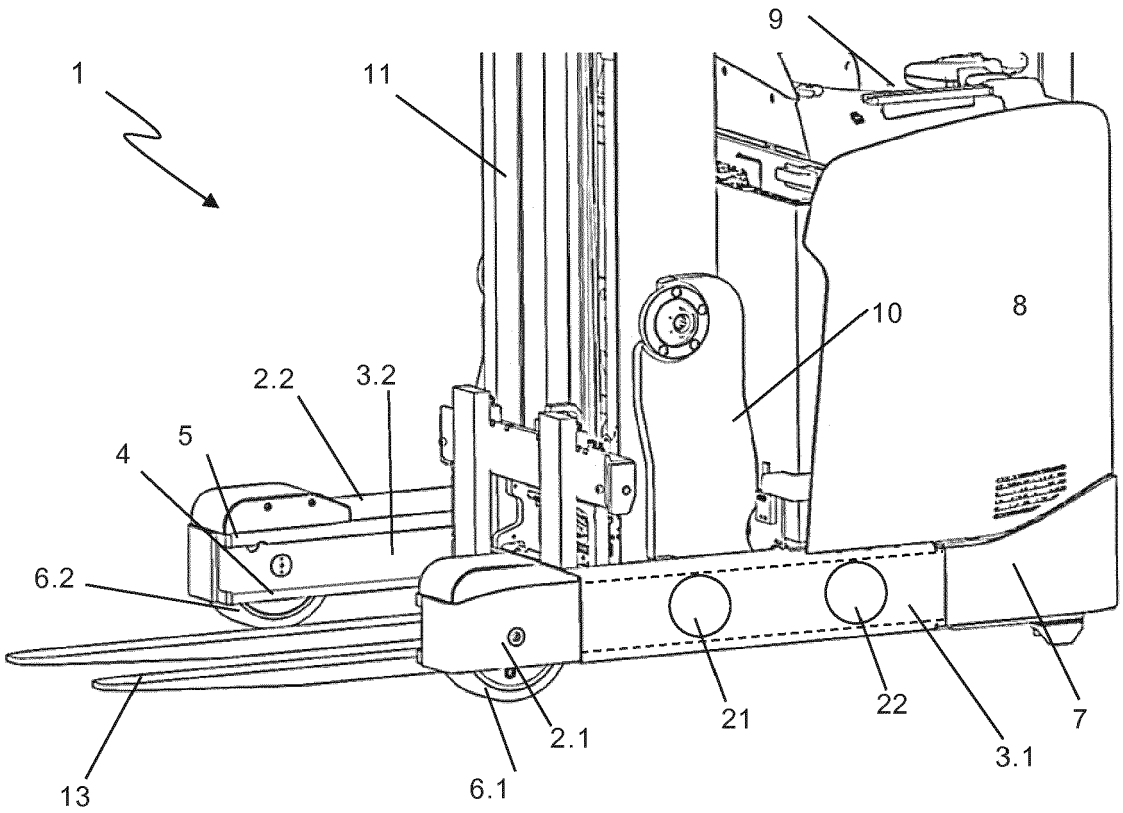


Fig.1

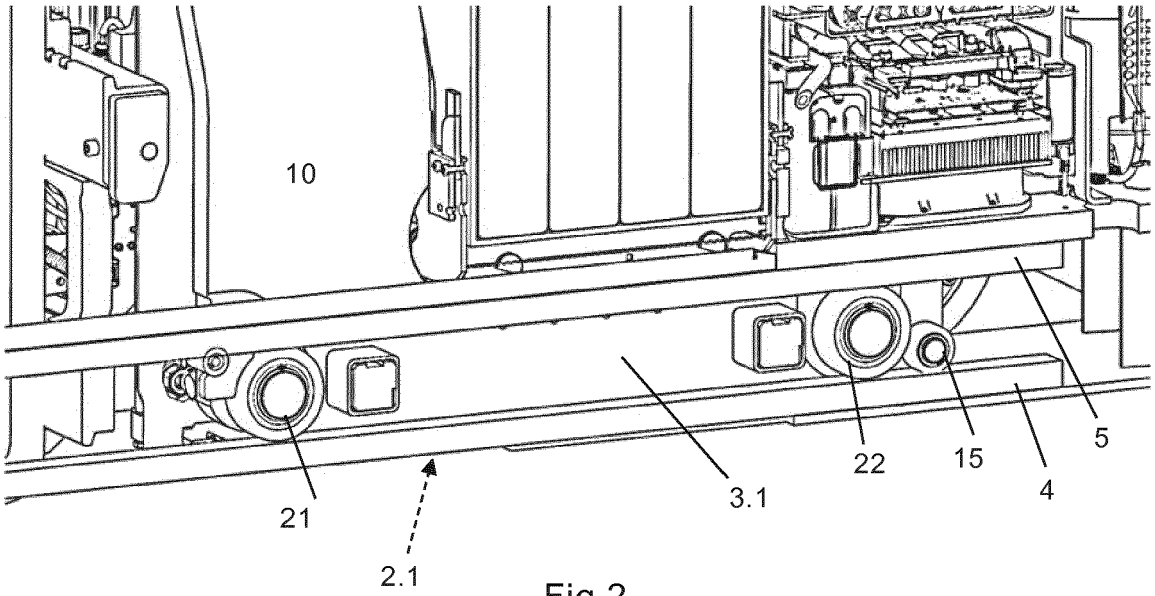
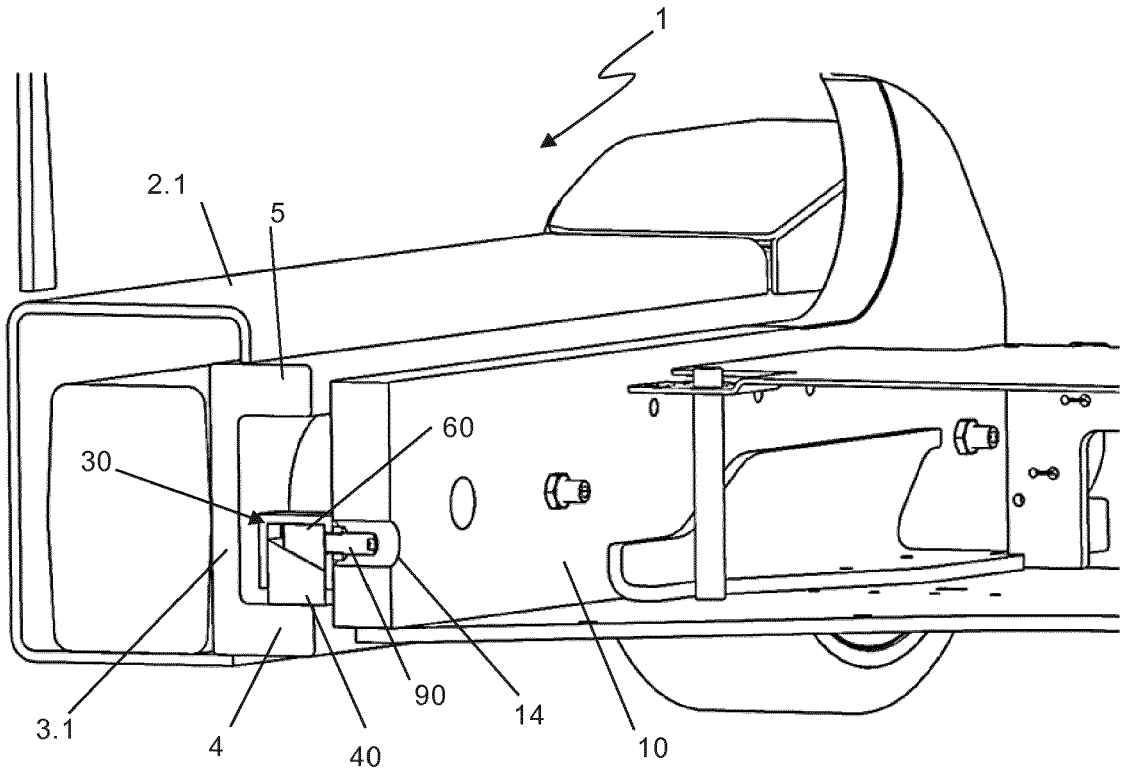


Fig.2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5
60
30
3.1
4
40
90
14
10

Fig.3

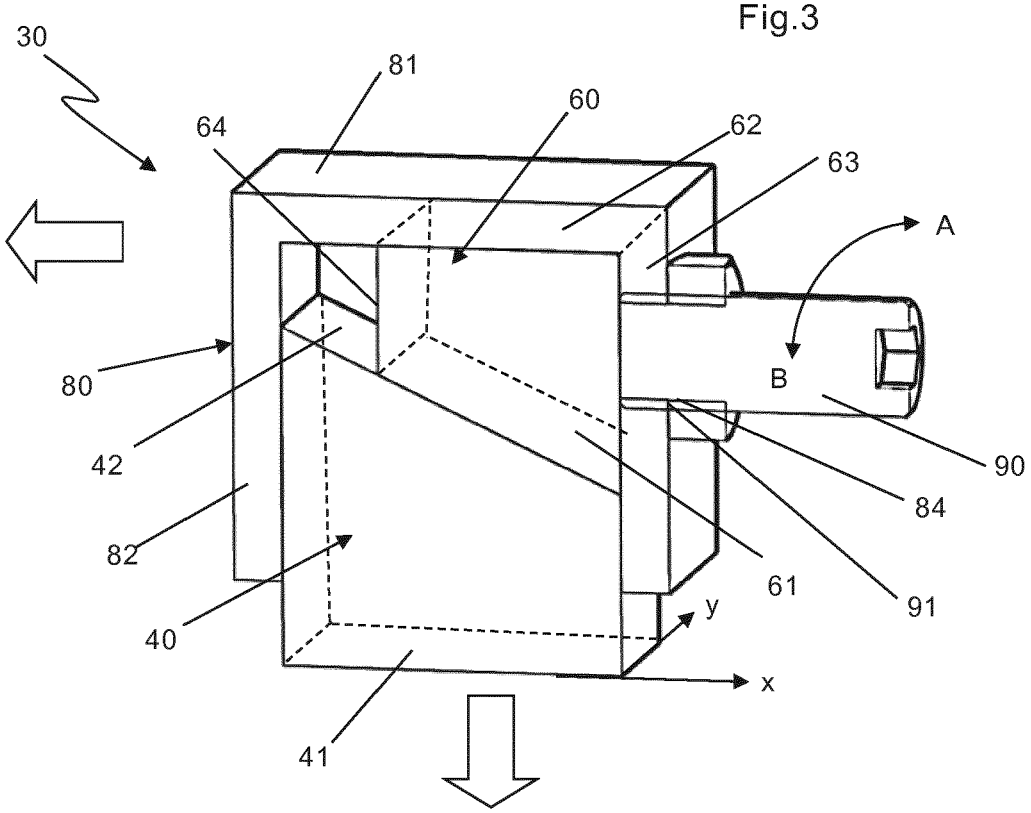
30
81
64
60
62
63
A
B
80
42
82
40
41
61
84
91
90
y
x

Fig.4

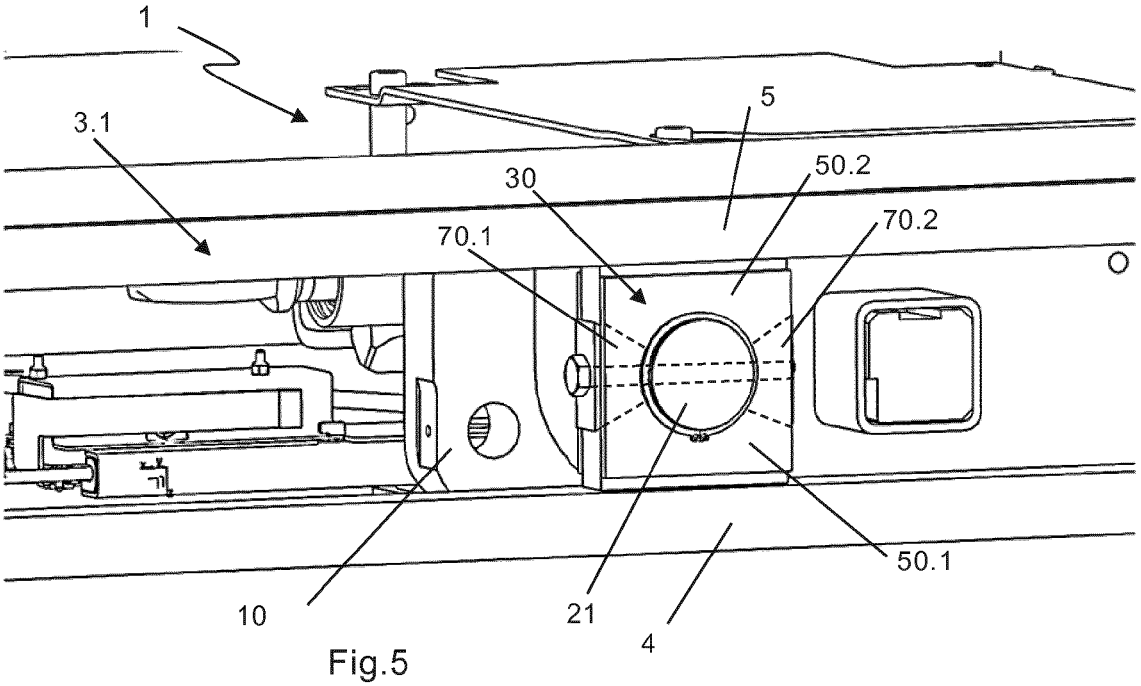
1
3.1
5
30
50.2
70.1
70.2
50.1
10
21
4

Fig.5

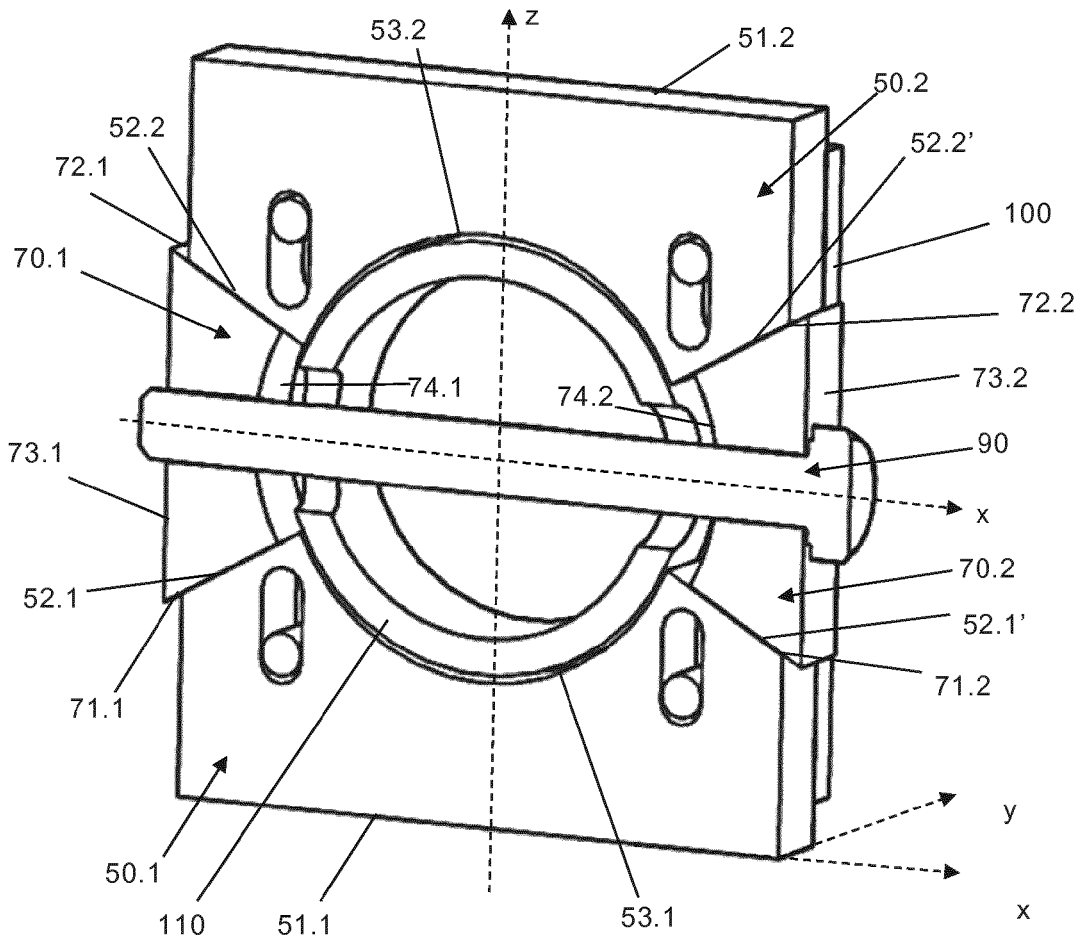
z
53.2
51.2
50.2
52.2
52.2'
72.1
100
70.1
72.2
74.1
74.2
73.2
73.1
90
x
70.2
52.1
52.1'
71.1
71.2
y
50.1
110
51.1
53.1
x

Fig.6

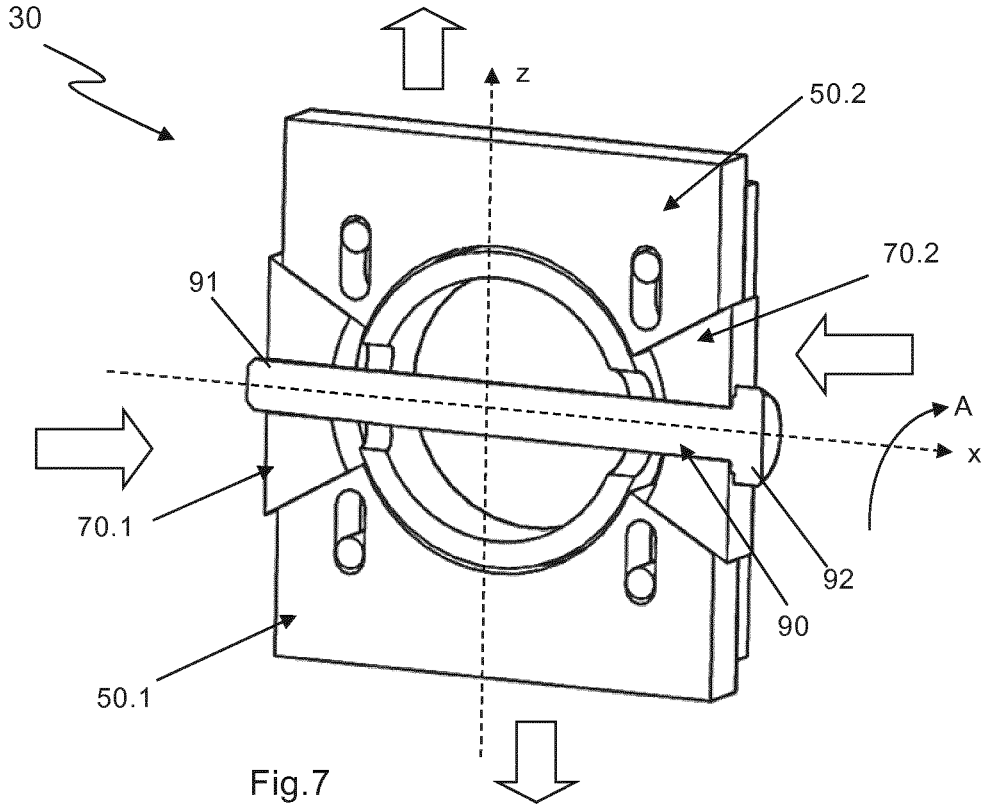

Fig.7

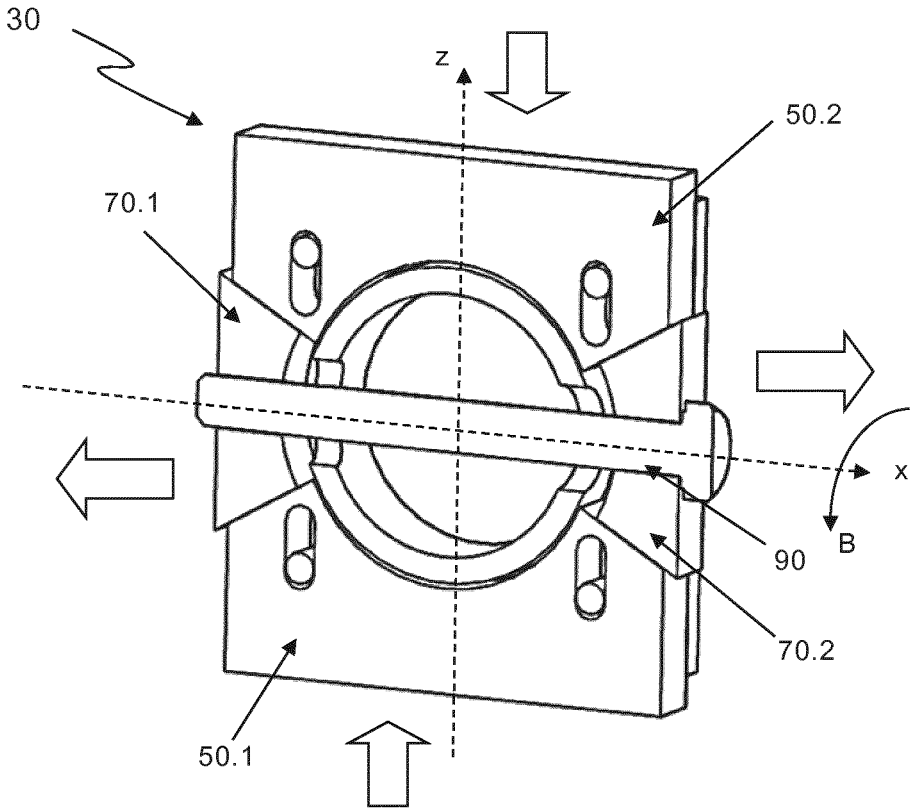

Fig.8

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EUROPEAN SEARCH REPORT

Application Number
EP 19 16 7465

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	JP 2010 058930 A (TCM CORP) 18 March 2010 (2010-03-18) * abstract * * figures 2, 3, 4, 5(a), 5(b) * * 4: "guide member" * * 20: "shakiness prevention apparatus" * -----	1	INV. B66F9/10
A	JP 2009 196721 A (TCM CORP) 3 September 2009 (2009-09-03) * abstract * * 3b: "flange part" * * 19: "shakiness prevention apparatus"; figures 2, 3, 4, 5 * -----	1	
A	JP 2009 126593 A (TCM CORP) 11 June 2009 (2009-06-11) * abstract * * figures 2, 3, 4 * * 4b: "flange part" * * 19: "shakiness prevention apparatus" * * figures 7, 8, 9 * * 30: "shakiness prevention apparatus" * -----	1	

TECHNICAL FIELDS SEARCHED (IPC)

B66F
F16C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	14 August 2019	Guthmuller, Jacques

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